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EXAMINER

ZERVIGON, R

ART UNIT PAPER NUMBER

1763

DATE MAILED:

04/25/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
08/860,763

Applicant(s)
Tokmulln et al

Examiner
Rudy Zervigon

Group Art Unit
1763



☒ Responsive to communication(s) filed on Feb 7, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-13 is/are pending in the applicat

Of the above, claim(s) 1 is/are withdrawn from consideration

☒ Claim(s) 7-13 is/are allowed.

☒ Claim(s) 2, 3, and 6 is/are rejected.

☒ Claim(s) 4 and 5 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Feb 7, 2000 is ☒ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☒ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Specification

1. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CFR 1.78).
2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Steven M. Gasworth (U.S.Pat. 5,204,145). Steven M. Gasworth describes a device for treating wafers with a plasma jet (column 3, line 65 - column 4, line 20). Specifically, Steven M. Gasworth describes:

- i. A plasma jet generator (item 1, Figure 1; column 4 lines 4-6)
- ii. Gas supply means (items 18,20, Figure 1; column 4 lines 13-15)
- iii. Holders (items supporting wafers 44, Figure 1; column 5 lines 15-38) with a drive (items 48, Figure 1; column 5 lines 38-65) for effecting angular displacement of wafers (items 44 Figure 1; column 4 lines 13-15) to be treated that face the plasma jet generator (item 1, Figure 1; column 4 lines 4-6).
- iv. As shown by figure 1, each holder is made in the form of a horizontal platform mounted for rotation about an axis passing through a geometric center thereof and perpendicular to a plane of the platform.

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- v. As shown from figure 1, each of the substrate holders and plasma jets are displaced with respect to each other OR out of contact with each other.
- vi. The plasma jet apparatus of Figure 1 would not function differently if the force of gravity and the flow of plasma jet were orientated at 180 degrees to each other as is suggested by the limitation whereby "...the plasma jet generator located such that a plasma jet is directed upwardly in respect of a plane of said horizaontal platforms of said wafer holders...". In effect, this would require turning the Gasworth apparatus upside-down.
- vii. Cooling means (item 52, Figure 1; column 5 lines 55-60) associated with each horizontal platform in fluid flow communication with the gas supply means in the sense of convective heat transfer from the heated gas supply means and the coolant flow circuit. The cooling means, inherantly having The differences in temperature of these fluids thus creating convection circuits in each fluid body thus providing cooling of individual areas over the wafer surfaces and avoiding the need to provide additional cooling (items 52, are the only means shown) of the plasma generator.

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Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steven M. Gasworth (U.S.Pat. 5,204,145) in view of JP4-124092 or Ikegaya et al (U.S.Pat. 5,539,176). The plasma jet apparatus of Steven M. Gasworth is discussed above in the rejection to claim 2. Steven M. Gasworth does not, however, describe a plasma jet mounted on an adjustable support that allows the treatment temperature to be changed according to desired treatment or processing of wafers. Both JP4-124092 (abstract) and Ikegaya et al (column 13, lines 35-65) each describe plasma jet utilization for treating wafers. Specifically, both JP4-124092 (abstract) and Ikegaya et al describe a plasma jet mounted on an adjustable support (Figure 1, of JP4-124092; Figure 4b; column 17, lines 35-60 of Ikegaya et al) that, implicitly, allows the treatment temperature to be changed according to desired treatment or processing of wafers. Ikegaya et al describes plasma jet height variability while JP4-124092 shows horizontal plasma jet variability.

It is the examiner's position that a person of ordinary skill in the art at the time the invention was made would have found it obvious to modify the Steven M. Gasworth plasma jet apparatus by implementing an adjustable support that allows the treatment temperature to be changed according to desired treatment or processing of wafers as is demonstrated by JP4-124092 (abstract) and motivated by Ikegaya et al (column 9, lines 25-26, lines 56-63; column 17, lines 52-54; column 24; lines 32-36).

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Allowable Subject Matter

5. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 7-13 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter: A key feature of the present invention is the vortex chambers (items 25, Figures 4,5; claim 7; page 6, last three lines) and interconnecting channels (items 26, Figures 4 and 5) that establish a hydrodynamic pressure in opposition to a hydrodynamic pressure established by a plasma jet thus maintaining the processed substrate free of contact during processing, which according to the inventors (page 4, item 3) "makes it possible to upgrade treatment quality due to the absence of the touch traces (scratches)." Additionally, temperature uniformity should be enhanced, as discussed in claim 7, due to the removal of a mode of heat transfer, namely, conductive. The limiters of claim 10 provide added stability to the wafer as "positioned near the holder" during processing.

Response to Arguments

8. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S.Pat. 5,273,588; 5,886,864; 5,838,528; 5,820,686

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official AF fax phone number for the 1763 art unit is (703) 305-3599. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached

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